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Neu eingegangene Arbeiten

A. Eichler and W. Gey, Physikalisches Institut der Universität Karlsruhe:
Superconductivity in α and ω-Zirconium Under High Pressure

The pressure dependence of the superconducting transition temperature $T_c(p)$ of α-Zr has been investigated in both solid and liquid pressure transmitting media. Up to about 45 kbar dT_c/dp was measured to be $+3.5\times10^{-6}$ K/bar. Cold working at 4.2 K produced a strong irreversible effect on T_c.

The superconductivity of the high pressure phase, ω-Zr, has been studied in its region of stability, i.e. above 60 kbar. For ω-Zr, $dT_c/dp=+7.7\times10^{-6}$ K/bar, and $T_c(0)=0.72$ K (by extrapolation).

F. Krahn, Institut für Kernphysik der Universität Münster:
Das *L*/*K*-Einfangverhältnis von ^{49}Vanadium

We could confirm experimentally the assumption of Heuer and Huster that the underground pulses in electron capture spectra are caused by incompletely amplified *K*- and *L*-pulses, and that therefore their method to evaluate the spectra is in its principle right. Further we have investigated the *L*/*K*-electron capture ratio of ^{49}V, which was not measured before. ^{49}V decays to the ground state of ^{49}Ti, and the capture ratio measured by us is $P_L/P_K=0.106\pm0.004$. This result and other experimental values got by several authors on elements with $18\leqq Z\leqq36$ are compared with the results of different theoretical evaluations.

U. Bertmann, F. Krahn und F. Huster, Institut für Kernphysik der Universität Münster:
Das *L*/*K*-Einfangverhältnis von ^{48}Vanadium

We measured the *L*/*K*-capture ratio of ^{48}V for all transitions simultaneously and found $P_L/P_K=0.104\pm0.004$. Coincidence measurements with the γ-rays by scintillation counters led to $P_L/P_K=0.115\pm0.015$. This latter value is not very exact, but the comparison of the number of K-pulses in the two sets of measurements allows the statement that the ^{49}V-impurity in the ^{48}V was less than 1.1% at the time of delivery and less than 10% during the measurements. So a possible ^{49}V-impurity did not disturb the results.

G. H. Dulfer, B. O. ten Brink, T. J. Ketel, A. W. B. Kalshoven, and H. Verheul, Natuurkundig Laboratorium, Vrije Universiteit, Amsterdam, The Netherlands:
On the Decay of ^{61}Zn and ^{60}Zn Using Mass Separated Sources

The γ-ray spectrum of ^{61}Zn and ^{60}Zn was studied with a 75 cm^3 Ge(Li) detector using mass separated sources. For the half-lives we found $T_{\frac{1}{2}}(^{61}\text{Zn})=89.1\pm0.2$ sec and $T_{\frac{1}{2}}(^{60}\text{Zn})=2.33\pm0.05$ min, together with the values $T_{\frac{1}{2}}(^{61}\text{Cu})=3.26\pm0.05$ hr and $T_{\frac{1}{2}}(^{60}\text{Cu})=24.0\pm0.3$ min for the half-lives of the daughter activities.

E. Konecny, W. Busse, B. Efken, E. Finckh und P. Pietrzyk, Hahn-Meitner-Institut Berlin und Technische Universität München:

Suche nach intermediären Substrukturen im Spaltungsquerschnitt von ^{232}Th + n

The resonances in the ^{232}Th(n, f) reaction at $E_n = 1.61$ and 1.72 MeV were examined for fine structure. With the experimental resolution of 8 keV no resolved fine structure was observed.

W. F. Hanson and E. T. Arakawa, Health Physics Division, Oak Ridge National Laboratory, Oak Ridge, Tennessee 37830:

High Energy X-Ray Satellites of $L_{2,3}$ Emission Bands of Na, Mg, Al, and Si

The x-ray satellites found on the high energy sides of the $L_{2,3}$ emission bands of Na, Mg, Al, and Si have previously been attributed to the radiative decay of double ionization states. However, in some recent papers it has been proposed that the satellites in Al and Si may arise from the simultaneous radiative decay of a core ionization state and a volume plasmon. A detailed investigation of the high energy satellites of the $L_{2,3}$ x-ray emission bands of Na, Mg, Al, and Si have been made for incident electron energies from 500 eV to 5 keV and the results compared with the double ionization theory. Plasmon involvement is also considered. The present results lend additional support to the first interpretation; namely, that the satellites arise from the radiative decay of atoms with a double vacancy in the $L_{2,3}(2p)$ shell and not from the plasma phenomenon.

M. Wagner and D. Kühner, Institut für Theoretische Physik, Universität Stuttgart:

Ab Initio Shell Models for the Lattice Dynamics of Ionic Crystals

The approach is based on the adiabatic principle and on a fundamental hierarchical postulate. The latter assumes that in the electronic ground-state the conduction-band contributions are small of first order for the chosen basic set of one-electron functions. From this linearized equations of motion beyond the Hartree-Fock approximation are established. Utilizing unitary transformations and Green's function techniques, the adiabatic potential for the lattice dynamics is calculated. It depends on the nuclear positions and on interband "shell-degrees of freedom" $N_{\alpha\beta} = \langle a_\alpha^+ a_\beta \rangle$ which are fixed by self-consistent subsidiary conditions. Transcription of the chosen quasi-Bloch-Basis to atomic quantities yields that for each transition $\alpha \to \beta$ at the single ion $m\mu$ and for each "charge-transfer" excitation $\alpha_1 \to \beta_2$ between two ions $m_1\mu_1$ and $m_2\mu_2$ there is one "shell degree of freedom". By projection onto spherical harmonics and summation integral shell modes of breathing, polarization and quadrupole-deformation may be introduced. It is realized that breathing and quadrupole deformation can be expected to have effects of comparable magnitude.

D. Zawischa, Institut für Theoretische Physik der Technischen Universität Hannover:

Pairing Interaction in Finite Fermi-Systems: Approximate Fulfilment of the Pauli-Principle in the Green Function Technique

The Green function method is used to treat pairing correlations in small systems. It is shown that the methods for normal systems can be used in the region of weak or medium interaction strength, provided that the energy dependent contributions to the irreducible particle-particle interaction which are necessary for the fulfilment of the Pauli-principle are not neglected. Comparisons with exact solutions and with other methods are given.

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